Supplementary file

Artificial intelligence assisted Chest Radiograph assessment as screening tool for COVID-19

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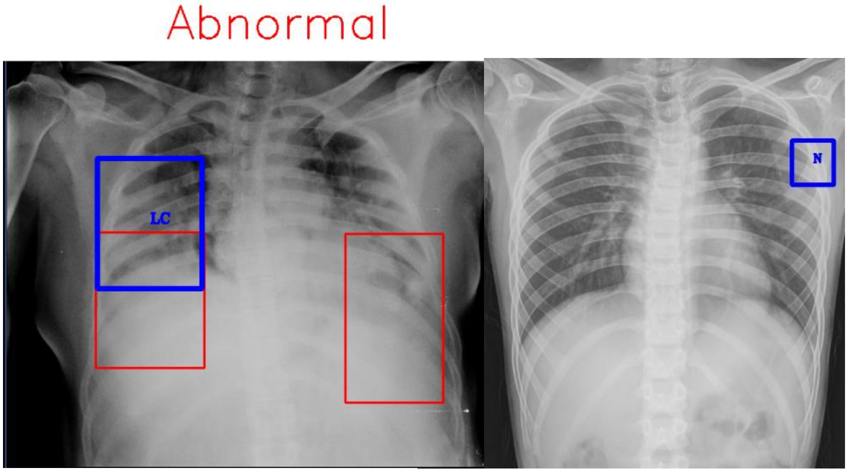
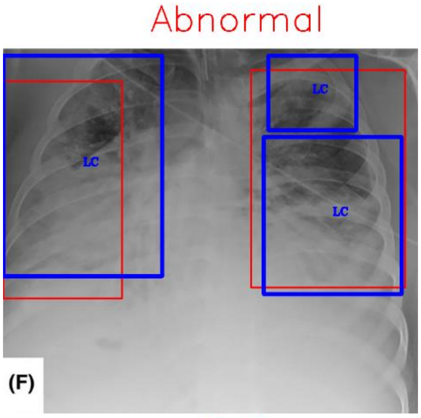
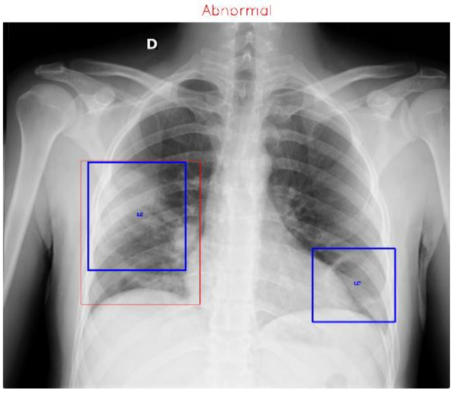
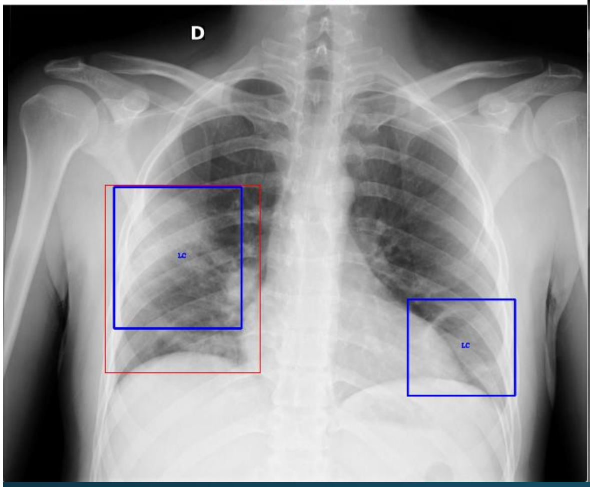




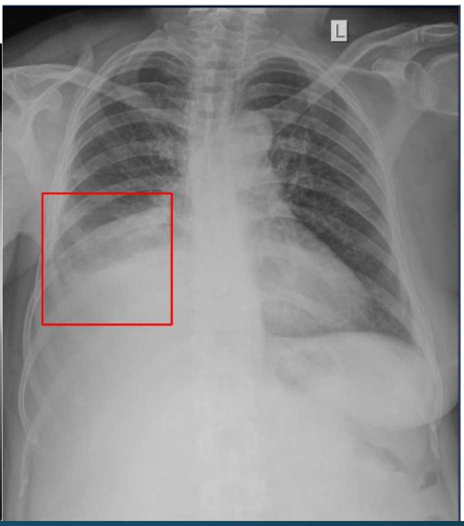


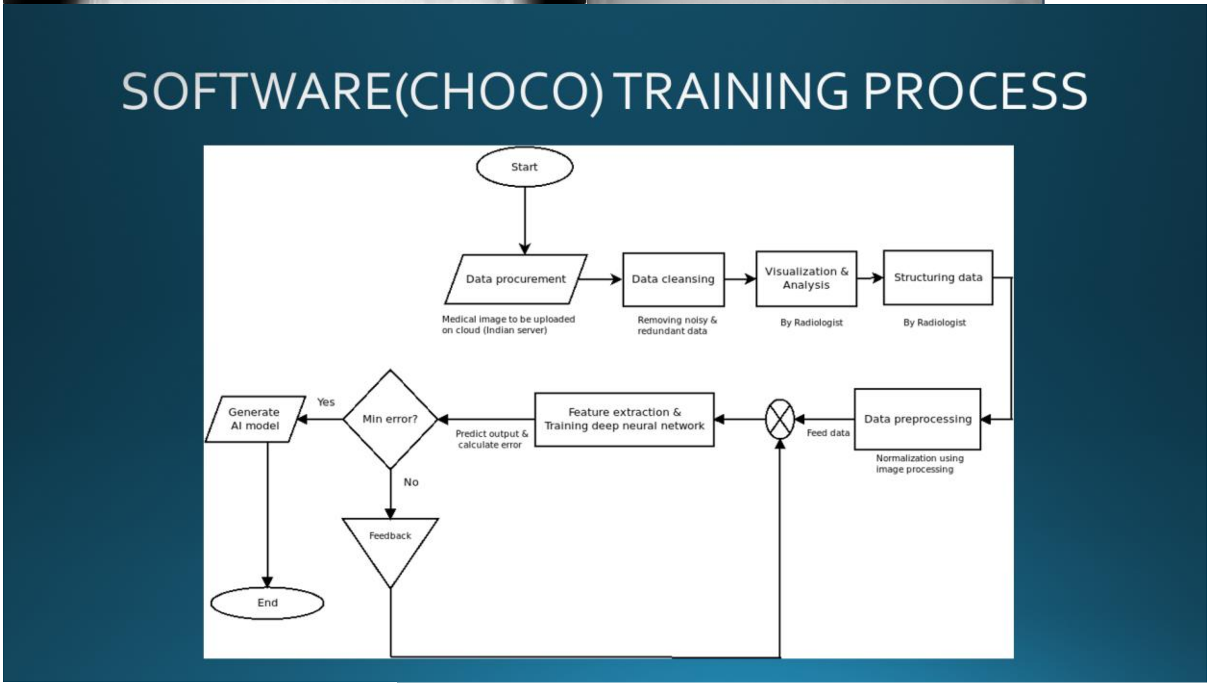
CXR of COVID-19 patients where AI software aiding in the diagnosis of normal , Likely covid pneumonia (LC)

Abnormal



Abnormal





SOFTWARE(CHOCO) TRAINING PROCESS

Start

Data procurement
Medical image to be uploaded on cloud (Indian server)

Data cleansing
Removing noisy & redundant data

Visualization & Analysis
By Radiologist

Structuring data
By Radiologist

Data preprocessing
Normalization using image processing

Feed data

Feature extraction & Training deep neural network

Predict output & calculate error

Min error?

Yes

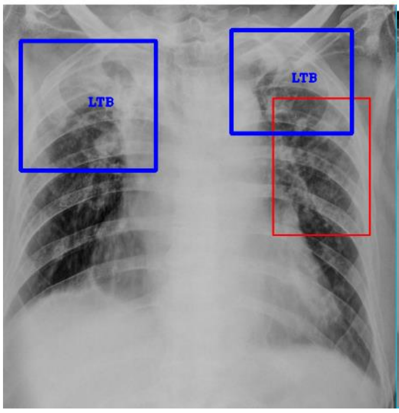
Generate AI model

End

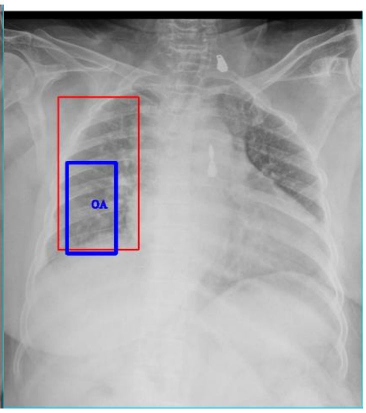
No

Feedback

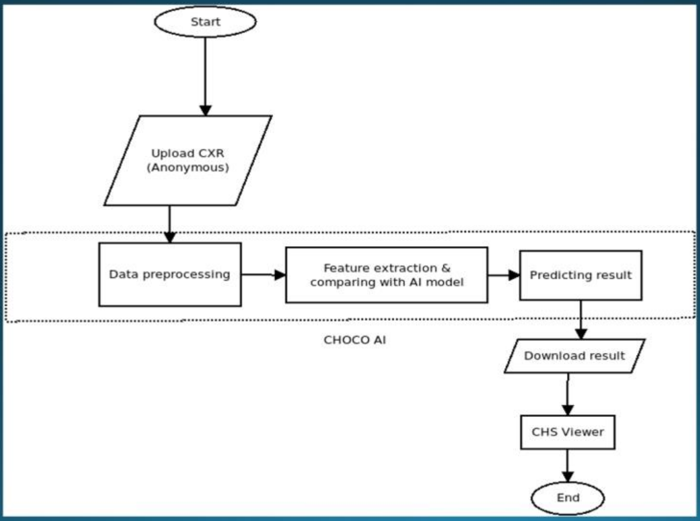
Abnormal



Abnormal



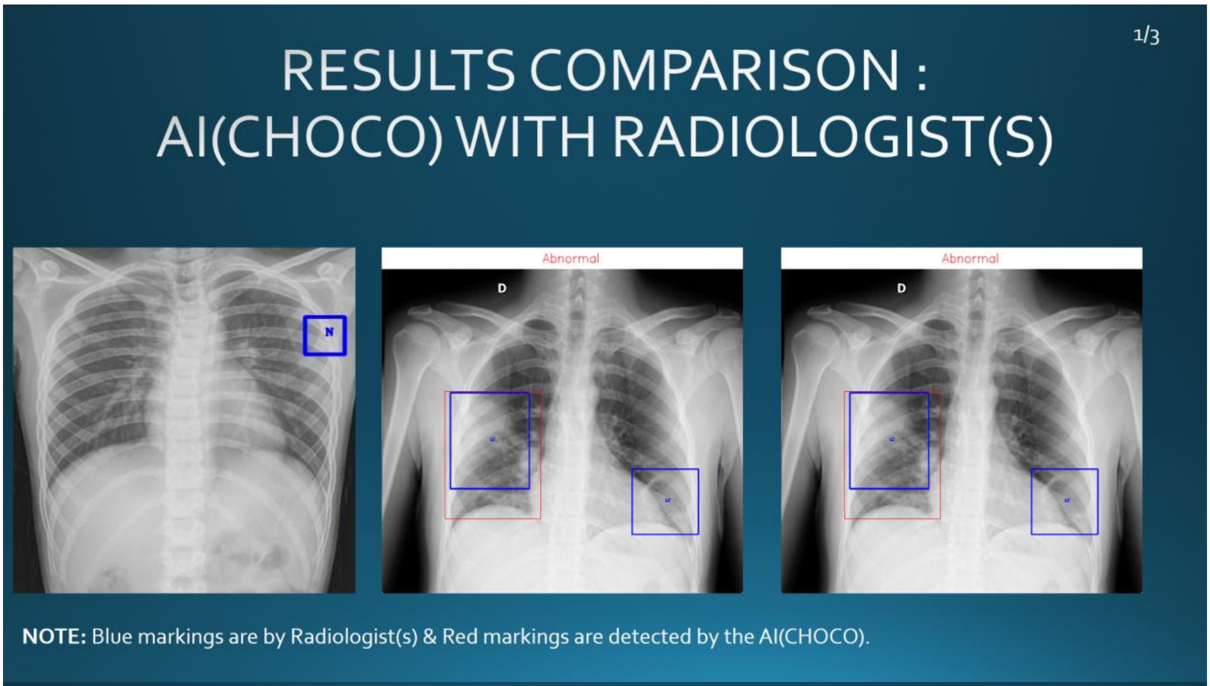
SOFTWARE(CHOCO) WORKFLOW



CLASSIFICATION BY SOFTWARE (CHOCO)

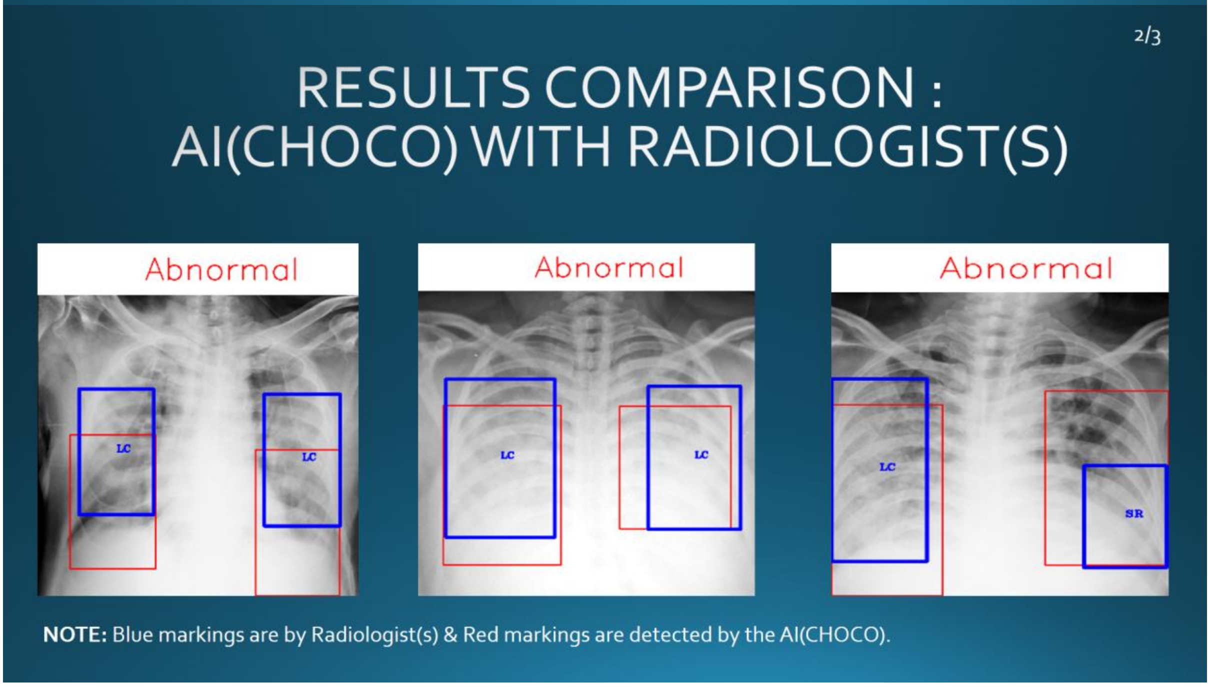
Chest X ray

- *Normal*
- *Likely COVID-19*
- *Other Abnormalities*



RESULTS COMPARISON : AI(CHOCO) WITH RADIOLOGIST(S)

NOTE: Blue markings are by Radiologist(s) & Red markings are detected by the AI(CHOCO).



RESULTS COMPARISON : AI(CHOCO) WITH RADIOLOGIST(S)

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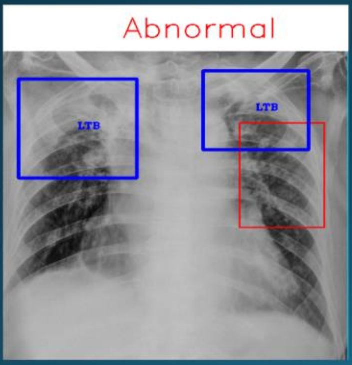
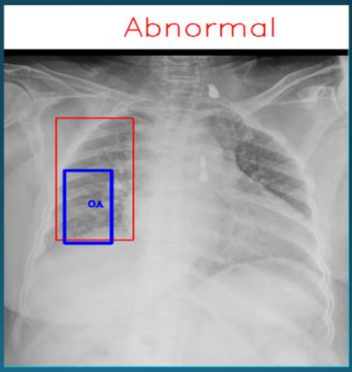
PERFORMANCE OF AI (CHOCO) IN DETECTION AND CLASSIFICATION OF ‘**ABNORMALITIES**’

Total processed	True positive	True negative	False positive	False negative
791	344	400	19	28

Sensitivity = 92 %
Specificity = 92 %
Accuracy = 94.05 %

RESULTS COMPARISON : AI(CHOCO) WITH RADIOLOGIST(S)





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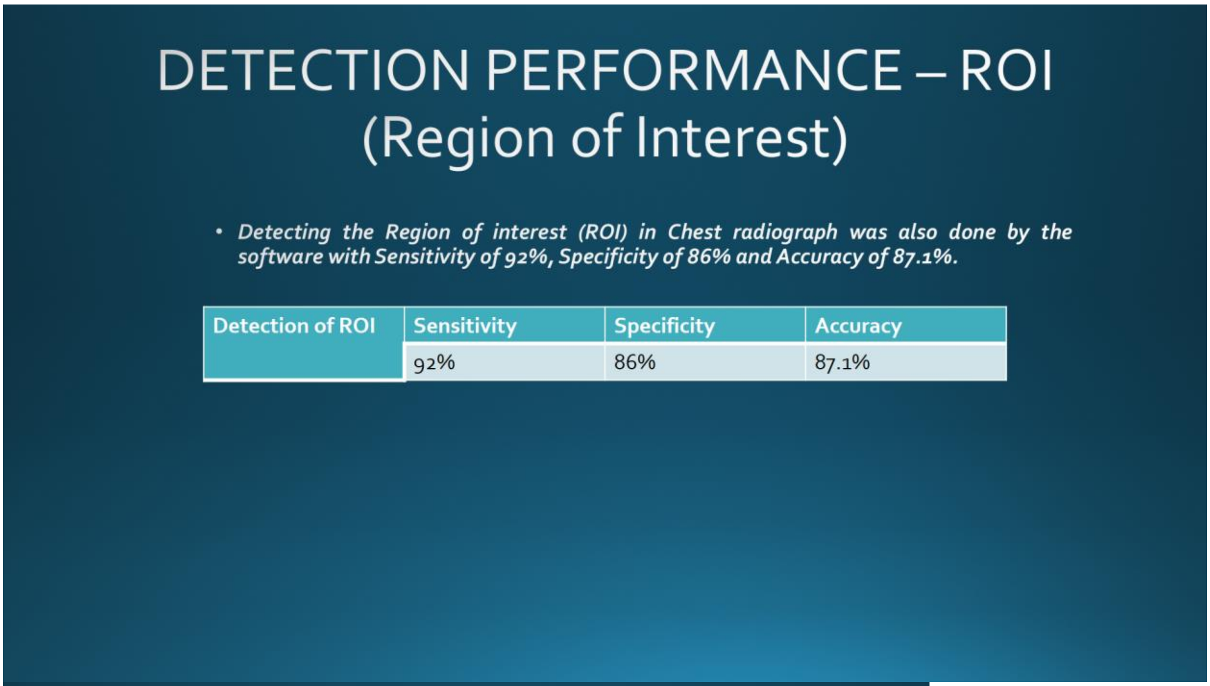
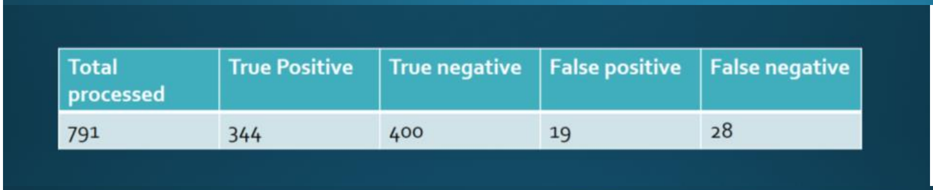


DETECTION PERFORMANCE – ROI (Region of Interest)

- *Detecting the Region of interest (ROI) in Chest radiograph was also done by the software with Sensitivity of 92%, Specificity of 86% and Accuracy of 87.1%.*

Detection of ROI	Sensitivity	Specificity	Accuracy
	92%	86%	87.1%



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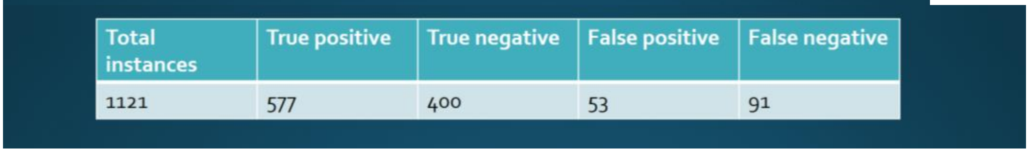

Total instances	True positive	True negative	False positive	False negative
1121	577	400	53	91